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ABSTRACT

For four years research has been conducted on the Concerns-Based Adoption Model. This model proposes a diagnostic/prescriptive process for guiding change in schools with the focus being on the individual teacher and what happens to her/him during the change process. Two important dimensions of the model are Stages of Concern about an Innovation and Levels of Use of an Innovation. Data on these dimensions have been collected from schools and teachers around the country and analyzed. This paper reports on how these dimensions were measured, the results obtained, and the implications from educators responsible for guiding change in schools. (Author)

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AFFECTIVE AND BEHAVIORAL CHANGE IN INDIVIDUALS INVOLVED IN INNOVATION IMPLEMENTATION

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Procedures for Adopting Educational Innovations Program
Research and Development Center for Teacher Education
The University of Texas at Austin

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American Educational Research Association,
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AFFECTIVE AND BEHAVIORAL CHANGE IN INDIVIDUALS INVOLVED IN INNOVATION IMPLEMENTATION[1,2]

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According to Berman and McLaughlin, "the literature on educational evaluations generally agrees that federal efforts to promote innovations have resulted in little consistent or stable improvement in student outcomes" (1975, p. 5). Sikorski was even more emphatic, stating that "disappointment is intense and wide-spread" regarding the outcomes of educational change efforts (1975, p. 1). Such disappointment stems from the realization that many educational innovations which have been introduced either have not actually been implemented, or have been modified so much that they hardly resemble the original.

For the past four years the NIE-funded Procedures for Adopting Educational Innovations (PAEI) Program has been involved in research efforts which have resulted in a rich empirical data base. Specifically, the program has attempted

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[1]Paper presented at the annual meeting of the American Educational Research Association, Toronto, March 28, 1978.

[2]The research described herein was conducted under contract with the National Institute of Education. The opinions expressed are those of the author and do not necessarily reflect the position or policy of the National Institute of Education, and no endorsement by the National Institute of Education should be inferred.

to develop a diagnostic/prescriptive process for guiding change. The focus of this work and the analysis of the data is on the individual teacher and what happens to him or her during the change process and what administrators or change agents can do to make the change less difficult and more effective.

The work of the PAEI Program is based on the Concerns-Based Adoption Model (CBAM). The primary goal of this work has been to verify the existence of two important CBAM dimensions, Stages of Concern About the Innovation (SoC), which addresses the affective component, and Levels of Use of the Innovation (LoU), which addresses the behavioral dimension. Measures have been developed for assessing both of these dimensions. These measures have been used in a series of cross-sectional and longitudinal studies in schools and universities across the country. The program work has also addressed questions related to the developmentalness of concerns and use and the relationship between the two. This paper reports on certain findings from these studies.

Several assumptions underlie the PAEI research. First, innovation implementation is individualistic, that is, each person decides for herself or himself how she or he will actually use the innovation. Secondly, those who do implement the innovation make individual decisions regarding the extent and manner of their use. A third assumption is that educational change is not an event that occurs at one point in time, but that it is a process that occurs over time. A final assumption is that the more information change facilitators (principals, deans, staff developers) have about individuals (teachers, professors) involved in change, the more effective they will be in guiding the change effort.

The Concerns-Based Adoption Model

PAEI research is based on a conceptualization that is embodied in the Concerns-Based Adoption Model (CBAM) (Hall, Wallace & Dossett, 1973), a set of

constructs that began in 1973 as hypotheses, which has since been strengthened and supported by a significant body of research.

The CBAM (see Figure 1) is a model representing two systems, a Resource System (e.g., a principal's professional library or an Educational Service Center) and a User System (innovation adopters) interacting through a Change Facilitator (staff developer, principal, consultant, resource system agent). The Change Facilitator probes individual users in the User System to determine the state of the implementation process. The implementation process is hypothesized to be developmental and reasonably predictable.

Having determined the state of the process at a given moment, the Change Facilitator is in a position to prescribe interventions which are designed to facilitate the implementation of the innovation. This information, which reveals the state of the process and makes prescription possible, comes in two major forms, Stages of Concern and Levels of Use.

Stages of Concern

One of the major dimensions of CBAM is Stages of Concern (SoC). This is the affective dimension in the CBAM. Seven different Stages of Concern About the Innovation have been identified and operationally defined and an SoC Questionnaire has been developed to assess them. These Stages of Concern are presented in Figure 2.

The Concerns-Based Adoption Model assumes that nonusers of an innovation will have relatively more intense Stages 0, 1, and 2 concerns, and less intense Stages 4, 5, and 6 concerns. As use of an innovation begins, Stages 0, 1, and 2 concerns will decrease in intensity; Stage 3 concerns will become more intense; while Stages 4, 5, and 6 concerns gradually increase in intensity. With increased experience and sophistication, Stages 4, 5, and 6 concerns will become relatively more intense while Stages 0, 1, 2, and 3 concerns further decrease in intensity.

Figure 1

THE CONCERNS BASED ADOPTION MODEL

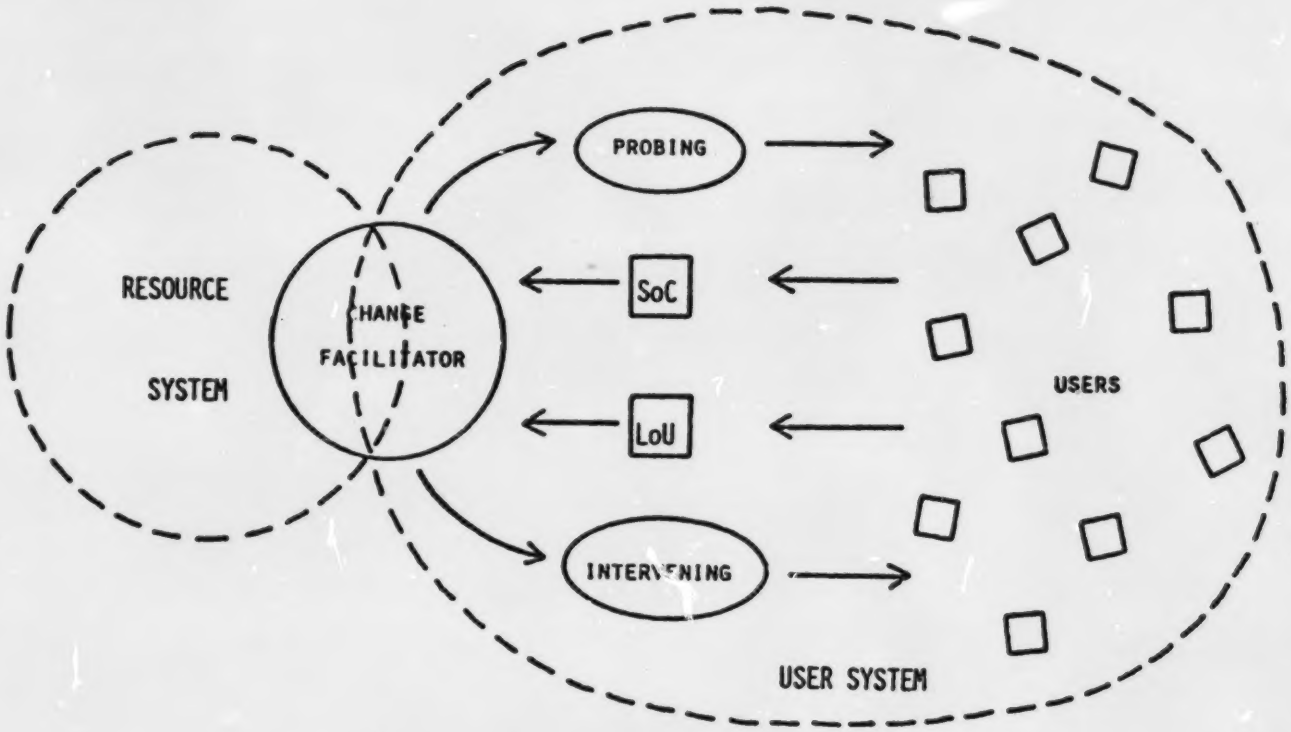

Figure 2

Stages of Concern About the Innovation[3]

0 AWARENESS: Little concern about or involvement with the innovation is indicated.

1 INFORMATIONAL: A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about himself/herself in relation to the innvation. She/he is interested in substantive aspects of the innovation in a selfless manner such as general characteristics, effects, and requirements for use.

2 PERSONAL: Individual is uncertain about the demands of the innovation, his/her inadequacy to meet those demands, and his/her role with the innovation. This includes analysis of his/her role in relation to the reward structure of the organization, decision making and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.

3 MANAGEMENT: Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.

4 CONSEQUENCE: Attention focuses on impact of the innovation on students in his/her immediate sphere of influence. The focus is on relevance of the innovation for students, evaluation of student outcomes, including performance and competencies, and changes needed to increase student outcomes.

5 COLLABORATION: The focus is on coordination and cooperation with others regarding use of the innovation.

6 REFOCUSING: The focus is on exploration or more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation.

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[3] Original concept from Hall, G.E., Wallace, R.C., Jr., & Dossett, W.A. A developmental conceptualization of the adoption process within educational institutions. Austin: Research and Development Center for Teacher Education, The University of Texas, 1973.

A Stages of Concern About the Innovation Questionnaire has been developed to measure the seven hypothesized Stages of Concern (George, 1977). This questionnaire consists of 35 items, each of which has a Likert scale on which respondents indicate their present degree of concern about the topic described in the item. There are five items for each Stage of Concern. A reliability study of the SoC Questionnaire, based on 132 professors and classroom teachers, was conducted in September 1974. The raw score test-retest correlations ranged from a low of .65 to a high of .96 on the seven SoC factors, and the internal consistency (alpha coefficients) of the factors ranged from .80 to .93.

Using a percentile table to score the SoC questionnaire data, an SoC profile can be developed for each individual. Figure 3 represents an example of such a profile. A user's manual has been developed describing the interpretation of SoC profiles (Hall, George & Rutherford, 1977). For statistical analyses, the person's high Stage of Concern is often used as a single number which represents that person's concerns. The high SoC is that stage on which the highest percentile is found. For example, Figure 3 contains a profile on which the high SoC occurs on Stage 2, Personal Concerns.

Levels of Use

The behavioral dimension of the Concerns-Based Adoption Model is Levels of Use (LoU). Eight distinct Levels of Use have been defined to account for individual variations in the use of an innovation. These levels range from lack of knowing that the innovation exists through active and efficient use and on to searching for improvement in the use of the innovation. Figure 4 names and briefly describes the eight levels. LoU is based upon the assumption that growth in quality of use of an innovation (movement toward higher levels) is developmental.

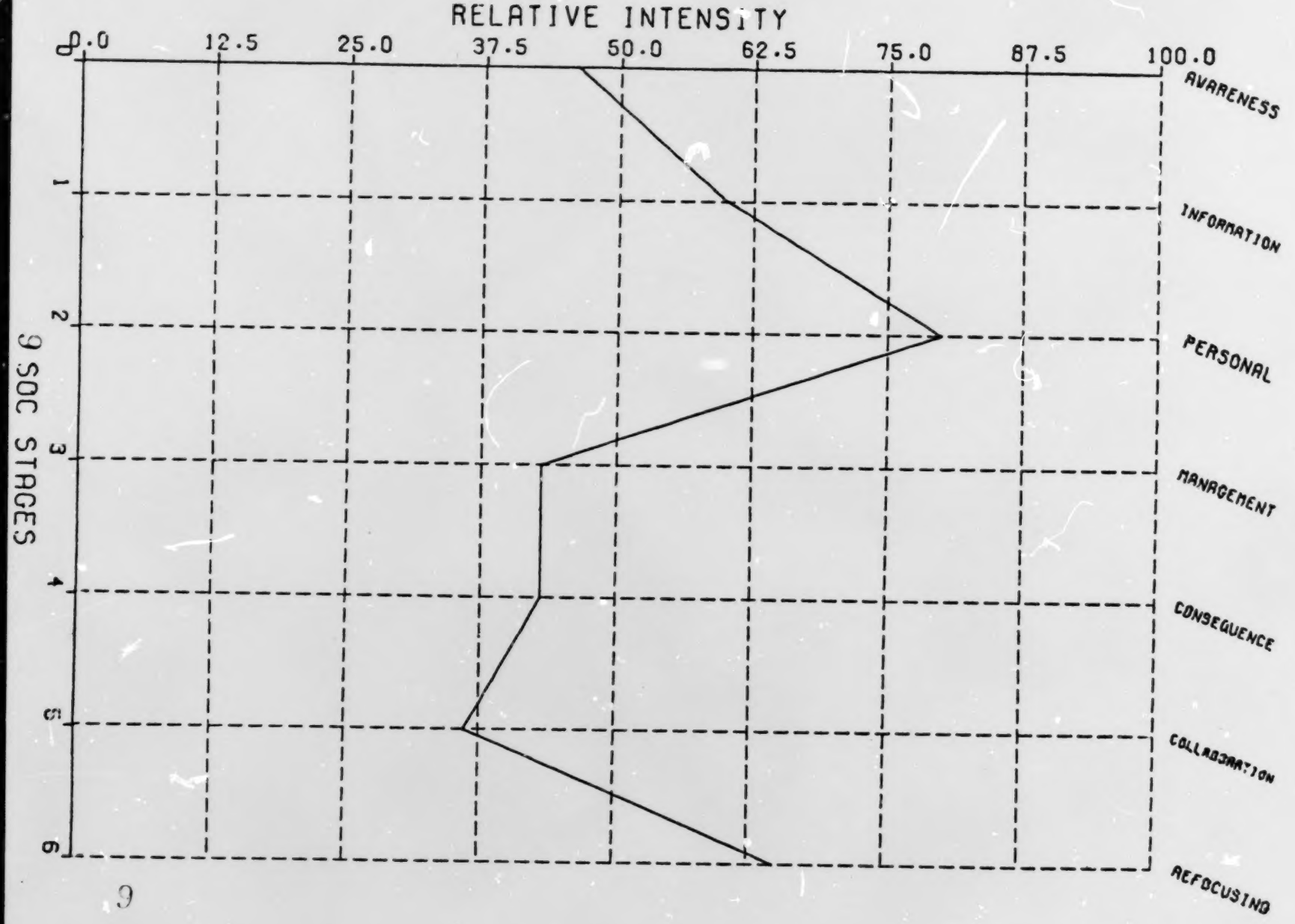

Figure 3
Individual SoC Profile

9

4-A

Figure 4

Levels of Use of the Innovation[4]

0 NONUSE: State in which the user has little or no knowledge of the innovation, no involvement with the innovation, and is doing nothing toward becoming involved.

I ORIENTATION: State in which the user has recently acquired or is acquiring information about the innovation and/or has recently explored or is exploring its value orientation and its demands upon user and user system.

II PREPARATION: State in which the user is preparing for first use of the innovation.

III MECHANICAL USE: State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use.

IVA ROUTINE: State in which use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.

IVB REFINEMENT: State in which the user varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.

V INTEGRATION: State in which the user is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.

VI RENEWAL: State in which the user reevaluates the quality of use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the system.

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[4] Excerpted from: The LoU Chart: Operational definitions of Levels of Use of the Innovation. Austin: Research and Development Center for Teacher Education, The University of Texas, 1975.

A focused interview procedure is used to obtain information for assigning a person to a Level of Use based on a set of Decision Points and operational definitions of Levels of Use. Complete details on the interview and the development and measurement processes leading to the LoU Chart are described in Loucks, Newlove and Hall (1976) and Hall, Loucks, Rutherford and Newlove (1975). Inter-rater reliabilities have been assessed on several occasions and range from .85 to .95. One validity study was conducted in which ethnographers' ratings of LoU correlated .98 with interviewers' ratings (Loucks, 1977).

Investigation of Affective and Behavioral Changes

For a period of two years, implementation of team teaching in public schools and instructional modules in higher education institutions were studied. Both Stages of Concern and Levels of Use data were obtained each fall and spring for two years for 146 teachers and 117 professors. Subjects of the study were drawn from 39 schools in three states and 9 universities in six states. An attempt was made to choose sites which had a wide range of experience with the innovations. Data in this report was gathered from individuals whose experience with the innovation ranged from no experience to five or more years of experience. Statistical analyses were made on these data for the purpose of answering the following questions:

1. What relationship exists between concerns and use?
2. How does high SoC change over time?
3. How does overall LoU change over time?
4. What relationships exist between changes in concern and use?
5. How do the above findings differ in the teaming and module populations?

Findings

How are the Stages of Concern and Levels of Use Related?

When the concerns profiles of users and nonusers are plotted, there are characteristic differences between the users and nonusers of an innovation. Users of an innovation are at or above LoU III (Management), while nonusers are at or below LoU II (Preparation). Figures 5 and 6 show the Stage of Concern profiles for users and nonusers of two innovations, modules at the university level, and team teaching at the elementary level. Each figure shows the concerns profiles of users and nonusers for each of four measurement periods spanning a two-year period. SoC profiles of users of the innovation are consistently different from profiles of nonusers. Users' concerns are lower than nonusers' on Stages 0, 1, and 2, and higher on Stages 4, 5, and 6. The nonusers have their highest concerns on the first three stages in both innovations. The users of modules (Figure 5) had distinctly higher concerns on Stages 4, 5, and 6 than they did on Stages 0 through 3, but this pattern was not as definite in the teaming data (Figure 6). These data confirm the theory of the CBAM in that they demonstrate that a definite relationship exists between the concerns about and use of an innovation.

How Does SoC Change Over Time?

Changes in concerns (high stage of concern) for the modules and teaming populations were not significantly different (chi-square = 2.12, $df = 8$, $p < .95$) so the data for these two populations were combined to answer this question. Table 1 shows the patterns of change in high SoC across three semesters of measurement of concerns of the 117 professors and 146 teachers. Table 1 is a 3 x 3 contingency table, changes from fall 1974 to spring 1975 constitute the vertical axis, and changes from spring 1975 to fall 1975 constitute the horizontal axis.

Matrix notation has been used to label the cells in the table. The reference number is enclosed in a small box in the upper left-hand corner of each of the

Figure 5

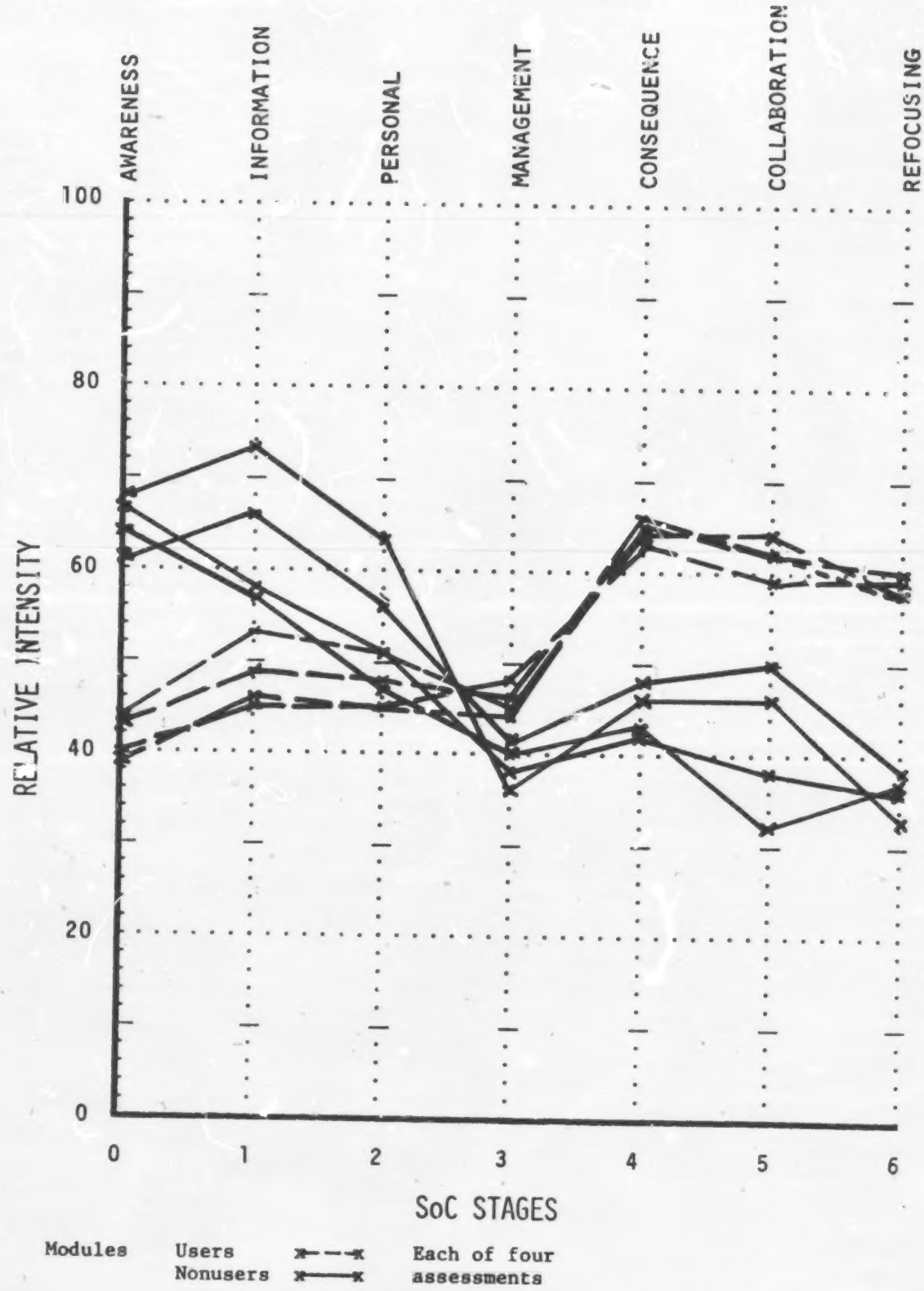
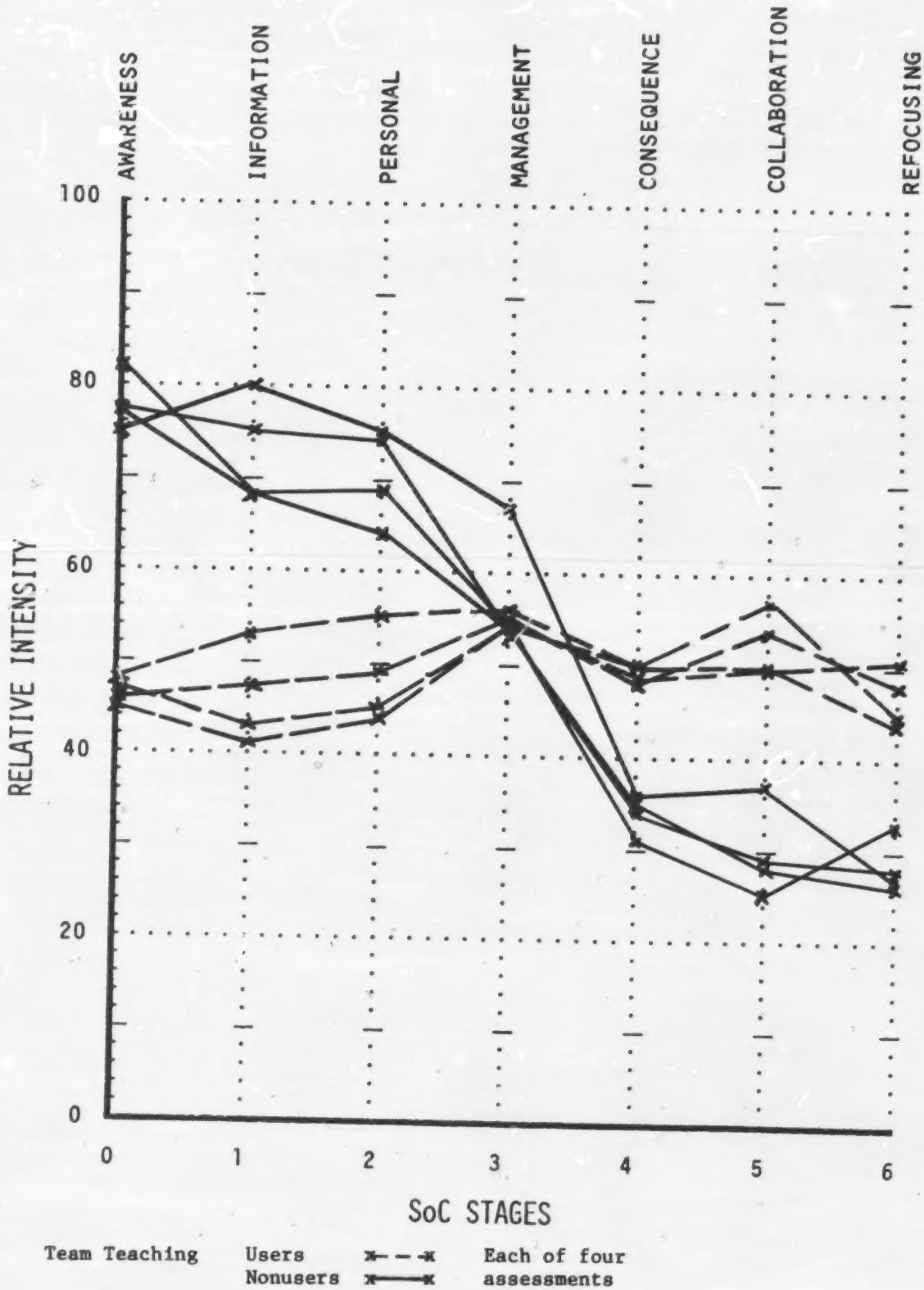

AWARENESS
INFORMATION
PERSONAL
MANAGEMENT
CONSEQUENCE
COLLABORATION
REFOCUSING
100
80
60
40
20
0
RELATIVE INTENSITY
0
1
2
3
4
5
6
SoC STAGES
Modules
Users
Nonusers
Each of four assessments

Figure 6


AWARENESS
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RELATIVE INTENSITY
0
1
2
3
4
5
6
SoC STAGES
Team Teaching
Users
Nonusers
Each of four assessments

Table 1

Changes in High Stages of Concern
for Teaming and Modules Combined

Spring 75 - Fall 75

Fall 74 - Spring 75	down	no change	up	
down	11 6 20.3 10.0	12 38 31.4 1.4	13 21 13.3 4.4	65
no change	21 34 33.7 0	22 52 52.2 0	23 22 22.2 0	108
up	31 42 28.1 6.9	32 37 42.5 1.0	33 11 18.5 3.0	90
	82	127	54	263

Chi-square = 26.7, df = 4, p < .01

Key:

reference number
Observed frequency
Expected frequency
Contribution to chi-square

cells in the table. Thus, cell 11 is in the upper left-hand corner of the table, and cell 33 in the lower right-hand corner of the table. The first digit in the reference number for each cell specifies the direction of the change in high SoC from fall 1974 to spring 1975, while the second digit specifies the change in high SoC from spring 1975 to fall 1975. The code for these numbers is as follows:

1 = a change from a higher SoC to a lower one,

2 = no change in SoC,

3 = a change from a lower SoC to a higher one.

For example, reference number 12 labels the cell for persons whose high SoC went down fall to spring and showed no change spring to fall. Thirty-eight persons exhibited this pattern of change.

Looking at the marginal totals, we see that 65 persons changed from a higher stage to a lower stage in the transition from fall 1974 to spring 1975, 108 persons showed no change in high SoC over this period, and 90 persons moved up in high SoC. During the transition from spring 1975 to fall 1975, 82 persons moved down in high Stage of Concern, 127 showed no change, and 54 moved up. The frequencies in the cells show that 6 persons moved down in high SoC across both of the transition periods (cell 11), 52 persons showed no change over the entire period (cell 22), and 42 persons moved up from fall to spring and then moved down from spring to fall (cell 31).

The observed and expected frequencies are shown within each cell, as well as the contribution of that cell to the total chi-square for the table. Fewer persons moved consistently down in high SoC than expected. Also, fewer persons moved consistently up in high SoC than expected (cell 33). A greater number of persons (42) moved up during the fall-spring transition and down during the spring-fall transition than expected (28, cell 31). Also, more first moved down

then moved up than expected (cell 13).

A chi-square calculated on these data indicates that a significant relationship exists between change in high SoC from fall to spring and change in high SoC from spring to fall, chi-square = 26.7, $df = 4$, $p < .01$.

It appears that if a person's Stage of Concern shifted to a higher stage during the school year, then that person could be expected to move to a lower stage over the next summer. Conversely, those who moved lower during the school year moved up over the summer. There is evidently a tendency for individuals to move back toward their beginning SoC, although these analyses do not indicate whether or not the combined moves place a person back at her or his original Stage of Concern.

How Does Overall LoU Change Over Time?

Tables 2 and 3 show the data from modules and teaming populations with respect to changes in overall LoU from fall 1974 to spring 1975 and spring 1975 to fall 1975. The contingency tables are constructed in the same manner as Table 1 and can be read in the same manner. Because there were significant differences between the teaming and module populations with respect to LoU, a separate table has been prepared for each. Chi-squares calculated on the data in each table indicate a significant relationship exists between change in overall LoU from fall to spring and change from spring to fall, chi-square = 19.2, $df = 4$, $p < .05$ for modules and chi-square = 47.0, $df = 4$, $p < .01$ for teaming.

The findings are much the same as in the SoC data. The largest discrepancy between expected and observed frequencies were those who moved up during the fall to spring transition and down during the spring to fall transition (cell 31 in each table). Few individuals showed consistent upward or downward movements over the three measurement periods. Those who moved down during the school year tended to either stay at the LoU to which they had moved or to move back up

Table 2

Changes in Overall LoU
Modules

Spring 75 - Fall 75

Fall 74 - Spring 75

	down	no change	up	
down	11 5 9.7 2.3	12 9 6.1 1.4	13 7 5.2 .6	21
no change	21 17 23.1 1.6	22 20 14.5 2.1	23 13 12.4 0	50
up	31 32 21.2 5.5	32 5 13.4 5.2	33 9 1.4 .5	46
	54	34	29	117

Chi-square = 19.2, df = 4, p < .05

Key:

reference number
Observed frequency
Expected frequency
Contribution to chi-square

Table 3

Changes in Overall LoU
Teaming

Spring 75 - Fall 75

Fall 74 - Spring 75	down	no change	up	
down	11 1 6.7 4.8	12 15 12.0 0.8	13 9 6.3 1.1	25
no change	21 7 18.4 7.1	22 44 33.1 3.6	23 18 17.5 0.0	69
up	31 31 13.9 21.1	32 11 24.9 7.8	33 10 13.2 .8	52
	70	70	37	146

Chi-square = 47.0, df = 4, p < .01

Key:

reference number
Observed frequency
Expected frequency
Contribution to chi-square

(cells 12 and 13). More prominent in the LoU data than in the SoC data was the tendency of those who did not change during the school year not to change over the summer. This tendency was more pronounced in the teaming data than in the modules data.

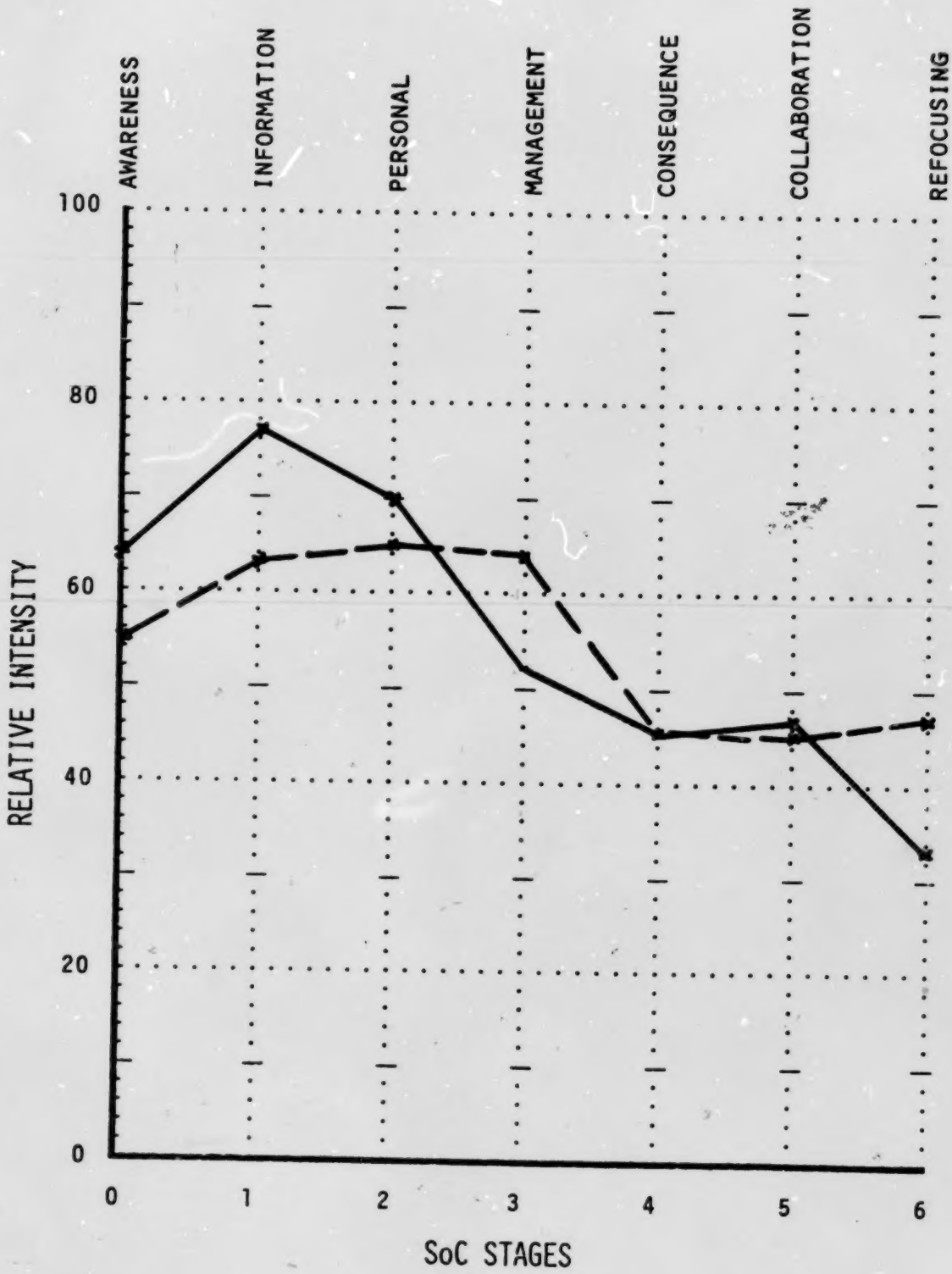
What Relationships Exist Between Changes in Concerns and Use?

There were no consistent relationships between changes in LoU and changes in high Stage of Concern. There were several statistically significant relationships between the assessed high Stage of Concern at the beginning of the study and subsequent changes in Level of Use. For instance, those teachers who showed an initial high Stage of Concern at Stage 0 showed a tendency to decline in LoU across the two-year study. Teachers who were at Stage of Concern 5 on the first measurement tended to show an increase in LoU across the two years. There were also a few trends which could be associated with specific initial Levels of Use. For instance, teachers at LoU IVB on the first measurement tended to show no change in SoC.

Determining relationships between SoC and LoU is handicapped by the use of the highest SoC percentiles as an indication of the individual's concerns. The use of the high SoC seems to be adequate when dealing with a group of teachers, but is not as useful for analyzing concerns of individual teachers. It is necessary to study the entire concerns profile to get an accurate picture of an individual's concerns, whereas it is often useful to plot the average of several individuals' SoC profiles in order to better understand the concerns of a group of users.

Figures 7 and 8 show how the concerns of users of teaming and modules changed as individuals moved from nonuse to use of the innovation. During the two-year study, 29 teachers moved from nonuse of teaming to use, and 30 professors moved from nonuse of modules to use. Figures 7 and 8 show the concerns profiles

Figure 7

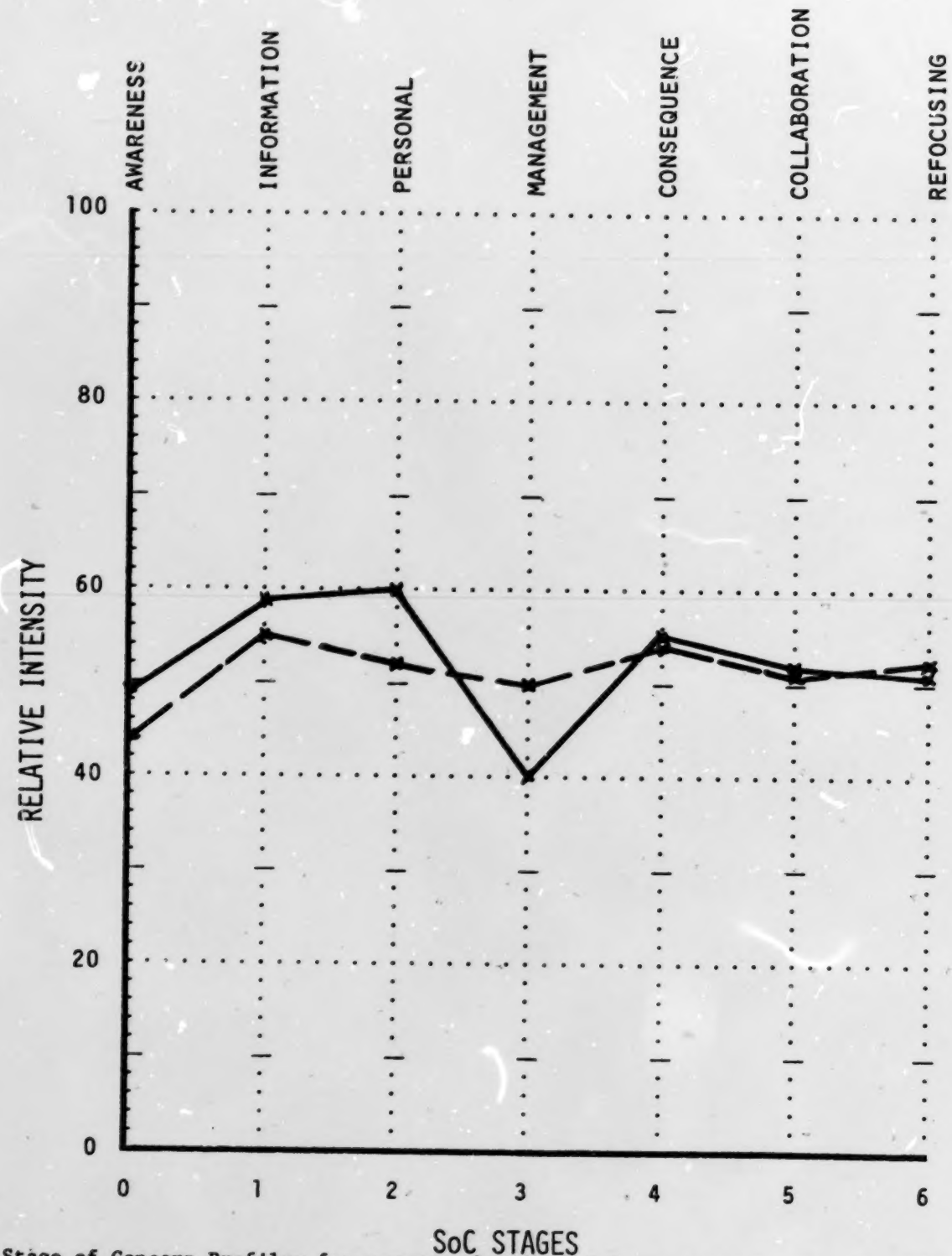


Stage of Concern Profiles for persons who changed from nonuse to use of team teaching. (N = 29)

Before ——×——×

After - - - ×- - -×

Figure 8



Stage of Concern Profiles for persons who changed from nonuse to use of modules. (N = 30)

Before ——×

After - - -×

of these individuals before and after their movement, respectively. There seems to be a definite shift downward in Stages 0, 1, and 2 within each population and a shift upward in concerns on Stage 3. When teachers began using teaming, the concerns on Stage 6 went up; this was not evident in the modules data. These data indicate that a shift from nonuse of the innovation to use of it is accompanied by a corresponding shift in concerns from the typical nonuser SoC profile to a profile more similar to the user profile.

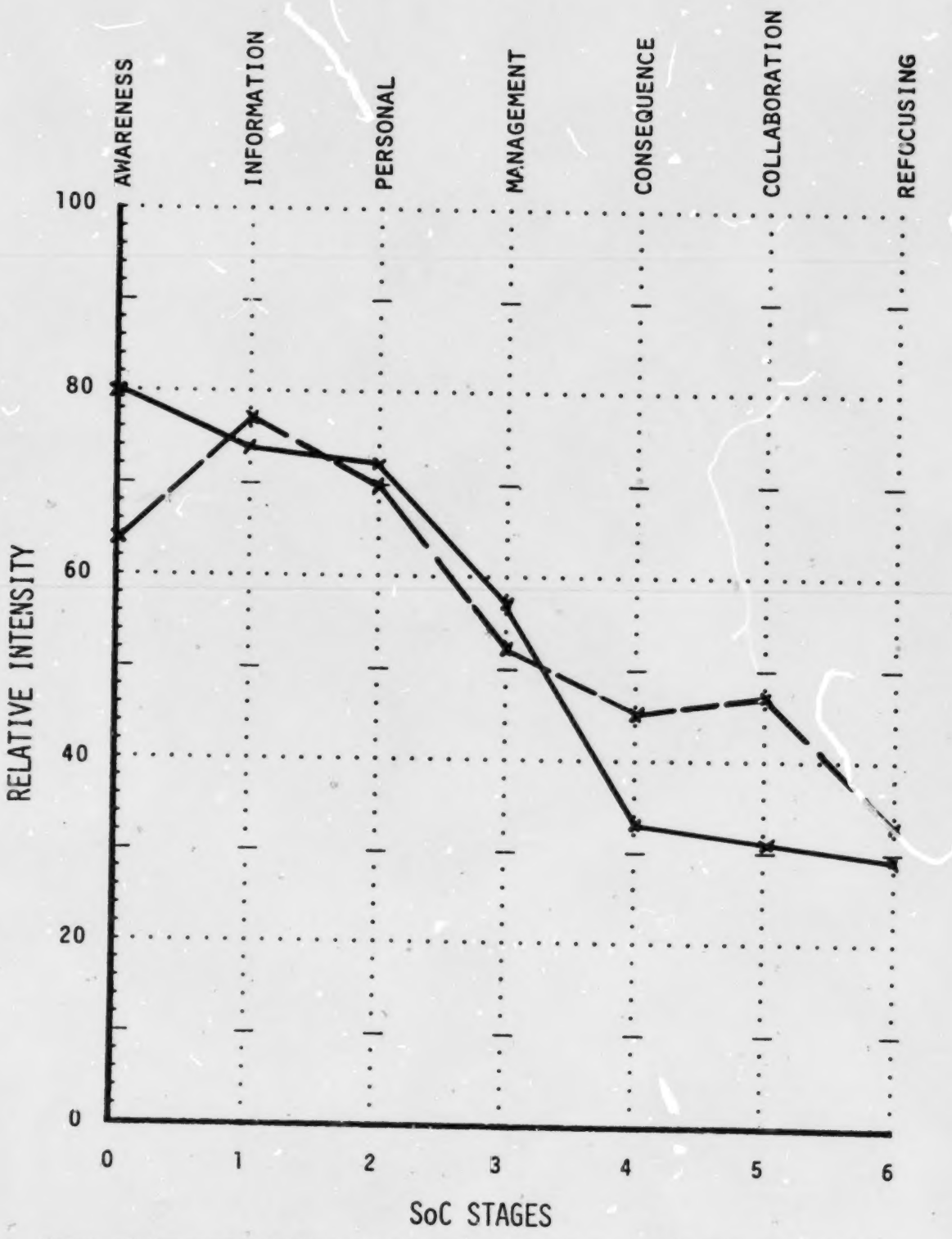
Figures 9 and 10 show that, even before the shift to user status, there are characteristic differences in SoC profiles between those who move to user status and those who stay nonusers. Figure 9 compares the profiles of the 29 teachers who began use with 96 teachers who were nonusers and did not become users. Figure 10 shows the same data for the 30 professors who moved from nonuse to use as compared to 140 individuals who did not move. In both populations, the individuals who were soon to become users had lower concerns on Stage 0 and higher concerns on Stages 4, 5, and 6 than those who were nonusers and did not change. There seemed to be lower concerns on Stage 1 in the teaming population within the group which was about to become users, but this was not true in the modules population. Thus, there is some indication that the change in use is preceded by a change in concerns.

Figures 11 and 12 show the "before" and "after" concerns for the 96 nonusers of teaming and the 140 nonusers of modules, respectively. The concerns profiles were essentially identical at the two measurement times. The data indicate that the differences between the profiles of those who changed and those who did not (see Figures 9 and 10) were not due to chance fluctuations in the data. Thus, we can be confident that the differences in profiles for the groups which did change were reliably different from those who did not.

How Do the Findings Differ in the Teaming and Modules Populations?

As has been pointed out, the general findings are very consistent across

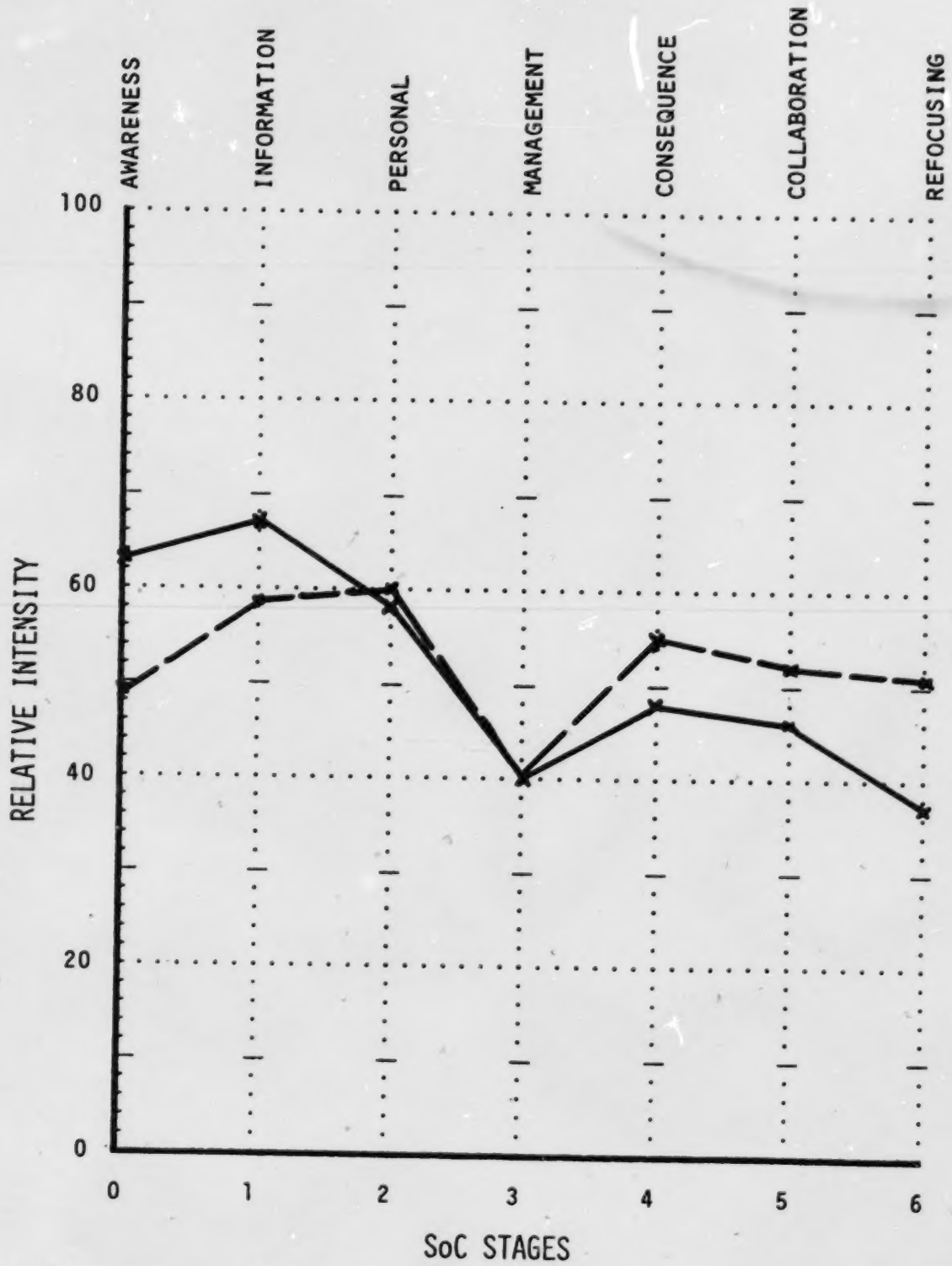
Figure 9



Stage of Concern Profiles for persons who did not begin use and for those who did begin use of team teaching.

Those who stayed nonusers ×——× (N = 96)
Those who started use ×– –× (N = 29)

Figure 10

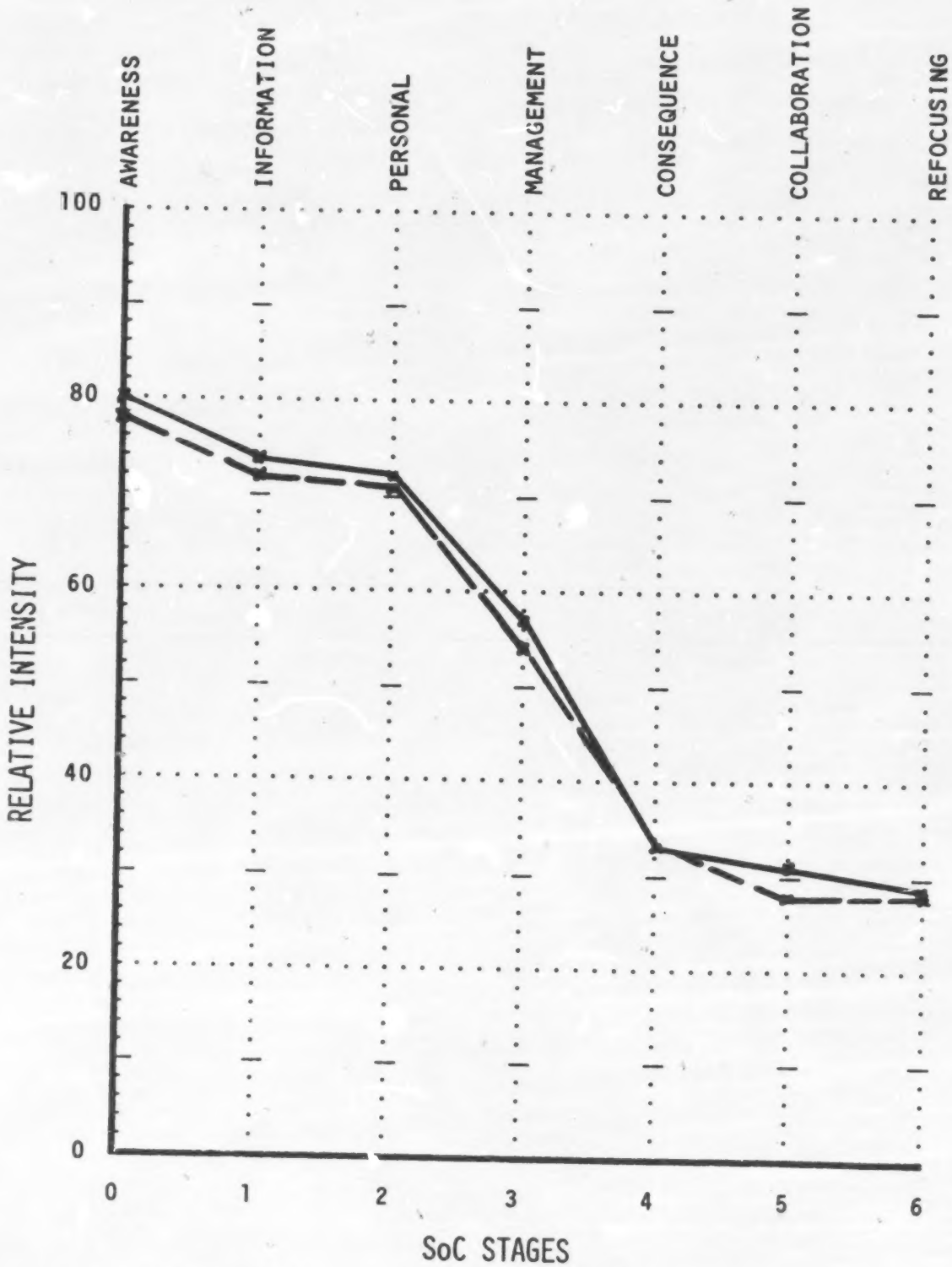


Stage of Concern Profiles for persons who did not begin use and for those who did begin use of modules.

Those who stayed nonusers ——— (N = 140)

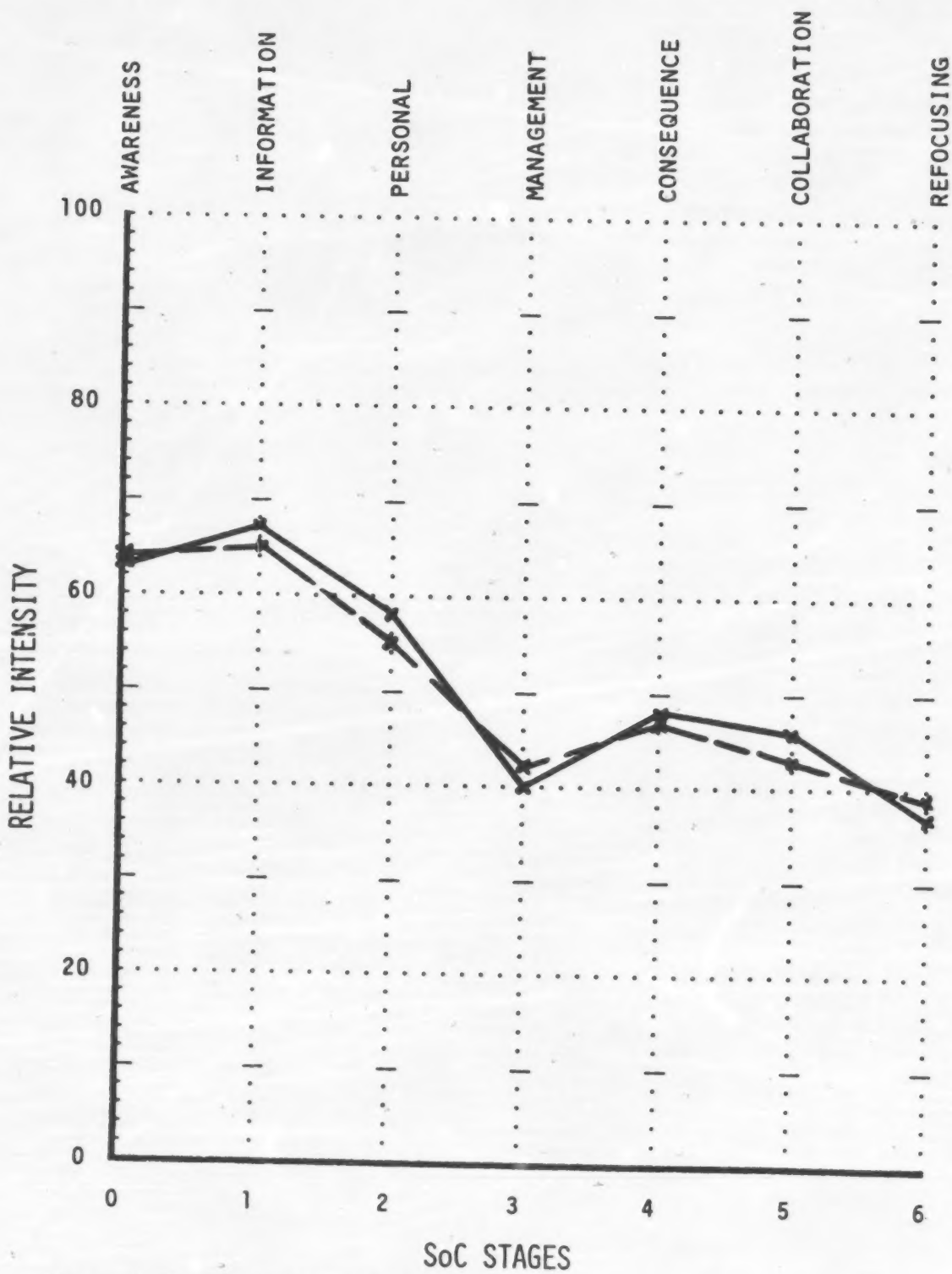
Those who started use - - - (N = 30)

Figure 11



Stage of Concern Profiles for persons who did not begin use of team teaching. (N = 96)
Before x——x
After x– –x

Figure 12



Stage of Concern Profiles for persons who did not begin use of modules.
(N = 140)
Before x——x
After x– – –x

the two populations studied. There seem to be only minor differences between the two populations; the changes from one time to the next and the differences between users and nonusers are remarkably similar.

Summary and Conclusions

For a period of two years the implementation of team teaching in public schools and instructional modules in universities were studied. Subjects were drawn from 39 schools in three states and 9 universities in six states. A major purpose of this study was to investigate the affective (Stages of Concern) and behavioral (Levels of Use) characteristics of individuals involved in the process of implementing use of educational innovations.

When interpreting these findings, it is important to remember that the subjects included a range from those who had never used either innovation to those who had been a user for five or more years. Also, in most institutions for both teaming and modules, there were no systematically planned programs of implementation to get individuals to use the respective innovations. Research presently underway is investigating the concerns and use of individuals from the time an innovation is first introduced to them through the first two years of implementation. In this research, there has been a planned implementation effort. It is hypothesized that persons involved in this systematic implementation effort will show more consistent upward movement in concerns and use than was evident in the research reported on in this paper.

Perhaps the most important conclusion that can be drawn from the findings of this study is that Stages of Concern and Levels of Use relative to an innovation can be reliably measured. Furthermore, this information can be collected reasonably easily and inexpensively. This means that the individuals who are responsible for managing and guiding educational change have two tools that can be used for diagnosing the affective and behavioral needs of individuals who are

engaged in change.

Findings from this research show there is a definite relationship between Stages of Concern and Levels of Use. Before beginning use of an innovation, individuals have greatest concern for informational and personal needs and very little concern about the impact of the innovation on students. After use has begun, there is a drastic change in concerns. Stages 0, 1 and 2 (Awareness, Informational and Personal) concerns become much less prominent and concerns about the impact of the innovation and problems of collaborating with others in using the innovation move noticeably upward. Stage 3 concerns (Management) are also high during the early period of use.

Clearly, among any group of individuals who are implementing an innovation, there are differences in concerns and use at any point in time. Efforts to intervene in the implementation process must be designed to accomodate these differences. For instance, an inservice workshop that is designed to increase the impact of an innovation may completely miss those with high Personal or Management concerns.

Not only are concerns and use related; there appears to be a predictive relationship between them. The data indicate that change in use is anticipated by a change in concerns. On the other hand, certain kinds of concerns profiles are suggestive of individuals who are not likely to change from nonuse to use in the near future. Change facilitators who have this kind of information will have a much greater opportunity to choose and apply interventions that match the needs of users or potential users and, at the same time, advance the entire implementation process. Stages of Concern and Levels of Use are two new and reliable tools that can make the process of innovation implementation more scientific and systematic.

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